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Journal of the Society of Arts.

FRIDAY, JUNE 14, 1861.

INTERNATIONAL EXHIBITION OF
1862.

The Council beg to announce that the Guar-

antee Deed is now lying at the Society's House for signature, and they will be much obliged if those gentlemen who have given in their names as Guarantors, will make it convenient to call there and attach their signatures to the Document. Signatures for sums amounting in the aggregate to £415,450, have been attached to the Deed.

GUARANTEE FUND FOR THE EXHIBITION OF 1862.

The following additions have been made since the last announcement, in the *Journal* for June 7:—

* * The names marked with an asterisk are those of Members of the Society of Arts.

NAMES.	AMOUNT.	REPRESENTING THE OBJECTS OF THE SOCIETY—ARTS, MA- NUFACTURES, AND COMMERCE.
*R. M. Jackson, 45, Piccadilly, W.	250	Commerce.
Lady Panmure, 19, Chesham-street, Belgrave-square, S.W.	500	Arts.
*Charles Lewis Gruneisen, F.R.C.S., 16, Surrey-street, Strand, W.C.	100	Arts.

By ORDER,

P. LE NEVE FOSTER, *Secretary*.INTERNATIONAL EXHIBITION OF
1862.

Her Majesty's Commissioners have given notice, in the *Gazette* of Tuesday last, that no demands for space, either from local committees or individual exhibitors, in the United Kingdom, Isle of Man, or Channel Islands, will be received after Tuesday, the 1st of October, 1861, and that the allotment of space will then be made on the returns sent in up to that date. Where no local committees are formed, provincial applications for space will be referred to, and determined by, national or metropolitan trade committees.

Her Majesty's Commissioners have appointed the following Class Committees in addition to those already published in the *Journal*:—

For Class 17 (Surgical Instruments and Appliances), William Laurence, Esq., F.R.C.S.; Jos. H. Green, Esq., F.R.C.S.; Jas. Moncrieff Arnott, Esq., F.R.C.S.; J. Flint South, Esq., F.R.C.S.; Cesar H. Hawkins, Esq., F.R.C.S.; Jas. Luke, Esq., F.R.C.S.; F. Seymour Haden, Esq., F.R.C.S.; Jas. Paget, Esq., F.R.C.S.

For Class 37 (Architecture), W. Tite, Esq., M.P., President of the Institute of British Architects; A. J. B. Beresford Hope, Esq.; T. L. Donaldson, Esq.; G. G. Scott, Esq., R.A.; M. Digby Wyatt, Esq.; Sydney Smirke, Esq., R.A.; James Fergusson, Esq.; and Arthur Ashpitel, Esq.

For Class 38 (Paintings in Oil and Water Colours and Drawings), Sir Chas. Eastlake, President of the Royal Academy; Sir J. Watson Gordon, R.A., President of the Royal Scottish Academy; S. Catterson Smith, Esq., President of the Royal Hibernian Academy; F. Y. Hurlstone, Esq., President of the Society of British Artists;

Frederick Tayler, Esq., President of the Society of Painters in Water Colours; Henry Warren, Esq., President of the New Society of Painters in Water Colours; R. S. Lauder, Esq., R.S.A.; and Richard Redgrave, Esq., R.A.

For Class 39 (Sculpture, Models, Die-sinking, and Intaglios), the Marquis of Lansdowne, K.G.; the Earl of Gifford, M.P.; J. H. Foley, Esq., R.A.; A. H. Layard, Esq., M.P.; R. Westmacott, R.A.

For Class 40 (Etchings and Engravings), W. H. Carpenter, Esq.; D. Colnaghi, Esq.; G. T. Doo, Esq., R.A.; R. J. Lane, Esq., A.R.A.; and W. Smith, Esq.

The following Local Committees have been formed, in addition to those already published:—

BANBURY.

The Mayor, President.
James Stockton, Esq., Secretary.

CHESTER.

The Mayor, President.
John Walker, Esq., Secretary.

DEWSBURY.

J. Smith, Esq., Secretary.

GLASGOW.

The Lord Provost, President.
John Kinnear, Esq., } Hon. Secretaries.
Dr. Strang, LL.D. }

GREAT GRIMSBY.

The Mayor, President.
H. M. Leppington, Esq., Secretary.

HERTFORD.

Philip Longmore, Esq., Secretary.

SHEFFIELD.

The Mayor, President.
Geo. Wilson, Esq., Secretary.

SUDBURY (SUFFOLK).

The Mayor, President.
J. T. Gooday, Esq., Secretary.

WARRINGTON.

The Mayor, President.

Thomas Geddes, Esq., Secretary.

The following arrangements, in addition to those already published, have been made in foreign countries in reference to the Exhibition:—

AUSTRIA.

The official *Wiener Zeitung*, of the 7th of June, states, that measures for the formation of a Commission, of which the Minister of Commerce will be President, are being taken, in order to facilitate and encourage Exhibitors to participate in the ensuing Exhibition.

Local Committees, assisted by the Presidents of the various Chambers of Commerce throughout the Austrian dominions, are to be formed for the purpose of stimulating the Manufacturers, and to select the articles of proposed Exhibitors.

It is further stated that every facility will be afforded by the Government lines of railway for the transmission of goods at a reduced scale of charges.

BELGIUM.

By a Royal Decree, bearing date 23rd of April, 1861, a Commission was appointed in Belgium with the view of assisting those manufacturers who purpose exhibiting their goods at the Exhibition of 1862.

Having taken into consideration that the Exhibition of 1851 cost the country the sum of 170,000 fr., though it was not open to every branch of Art which will be represented at the forthcoming Exhibition; and being fully persuaded that the Belgian Exhibitors, on the present occasion, will be much more numerous than was the case either in 1851, or even in 1855, the Commission recommended that a grant of 225,000 fr. should be applied for from the Government, to defray the necessary expenses of transport, &c. This amount was granted by Royal Decree, dated 12th May, 1861.

On the 23rd May, 1861, a circular was addressed by the Minister of the Interior to the various Chambers of Commerce throughout the kingdom, informing them of the steps that had been taken; that His Royal Highness the Duke of Brabant had graciously consented to be the President of the Commission, and requesting their cordial support in promoting the undertaking.

At the same time a circular was sent to all the principal artists in the country, inviting them to contribute a choice selection of their works, and fixing the Exhibition of Belgian Art to the works of those artists who were alive in or subsequent to 1830.

BAVARIA.

Le Comité de l'Administration Centrale de la Société Polytechnique, Munich.

HESSE DARMSTADT.

M. le Conseiller intime Eckhart, à Darmstadt, Président de l'Association industrielle du Grand Duché de Hesse.

PORTUGAL.

His Majesty, the King, Dom Fernando II., President: Counsellor Joaquim Larcher, Director-General of the Department of Commerce and Manufactures, Secretary.

TASMANIA.

W. L. Crowther, Esq., Board-room, Colonial Secretary's Office, Tasmania, Chairman.

Secretaries of Institutions in Union are requested to forward, as soon as possible, to the Secretary of the Society of Arts, the names of the Representatives appointed to attend the Conference, stating at the same time (if possible) whether those gentlemen will also be present at the Society's Annual Dinner, which will take place on the following day, and of which particulars are given below.

The Chairmen of, or Representatives from, the several Local Boards of Examiners are invited to attend.

The Council will lay before the Conference:—

1. The Secretary's Report of the proceedings of the Union for the past year.

2. The Programme of the Examinations for 1862.

3. The Minutes of the Meeting which, at the suggestion of the Southern Counties Education Society was held here, to establish the "Central Committee of Educational Unions, in connexion with the Society of Arts." [See *Journals* of February 22nd and April 12th.]

* * The objects of that Committee are to promote a uniformity of standard in the Local Elementary Examinations, and to give a settled uniform value to the Local Certificates. The Council will be glad to ascertain, from the Representatives of Institutions and of the Local Boards, whether, in their opinion, those bodies are likely to be benefited by the action of the Central Committee.

4. In connexion with this subject, the Conference will be invited to consider whether it is desirable to pass any resolutions suggesting the further grouping of neighbouring Institutions in County or District Sub-Unions.

5. The Council will communicate to the Conference the Resolutions passed on the 6th of February, and published in the *Journal* of the 15th of that month, in favour of the establishment of District Museums, and the systematic circulation of interesting objects for temporary exhibition therein.

6. The Council will call attention to its recent communications with the Company of Painters' Stainers, [see *Journal* of 26th April], and will invite the Conference to consider whether any Resolutions should be passed in favour of Competitive Exhibitions of Works of Skilled Labour.

7. The Conference will be asked to consider whether arrangements should be made to enable Excursion Parties of Institutions in Union with the Society of Arts to assemble in a great gathering at the Crystal Palace, on Monday, the 26th, or Tuesday, the 27th of August, or on some other day.

8. The adjourned question, whether the Institutions can advantageously make arrangements for their members to visit the International Exhibition of 1862, will be brought forward.

9. At the last Conference it was agreed that the subject of Mr. Buckmaster's motion (of 1859), respecting the exclusion of Institutions from the Parliamentary Grants for Education, should be further discussed at the ensuing Conference.

10. The Representatives will be asked whether they desire that the Society should print and issue to the Institutions another edition of the List of Lecturers.

Notice of any other subjects which Representatives may wish to submit to the Conference, should be given to the Secretary of the Society of Arts.

TENTH ANNUAL CONFERENCE.— NOTICE TO INSTITUTIONS.

The Tenth Annual Conference between the Representatives of the Institutions in Union and the Council will be held on **Tuesday next, the 18th inst., at half-past 10 o'clock in the morning.**

ANNUAL DINNER.

The One Hundred and Seventh Anniversary Dinner of the Society will take place at the Crystal Palace, Sydenham, on Wednesday next, the 19th inst., at 5 o'clock, punctually. The Right Hon. the Earl of Elgin and Kincardine, K.T., G.C.B., will preside.

The Members and their friends will assemble in the ante-room of the Dining Hall, in the Railway-wing, at half-past four o'clock. Application for Tickets (price 10s. 6d. each) should be made to Mr. Samuel Thomas Davenport, at the Society's House. It is particularly requested that those who intend to be present will take their tickets as soon as possible in order to facilitate the arrangements.

EXAMINATIONS, 1861.

In the list of Candidates who have obtained Certificates, published in the *Journal* for May 31, a second-class certificate in Algebra is erroneously given to No. 477, William Dale, who did not come up to the Final Examination, instead of to No. 447, George Noble Withall, aged 18, of the Sussex Hall Evening Classes, Clerk, he having written a wrong number on his papers.

Also, for "No. 642, Goyne, George," read "No. 642, Goyne, John."

CHARCOAL AIR FILTERS FOR THE VENTILATION AND DISINFECTION OF SEWERS.

By JOHN STENHOUSE, LL.D., F.R.S.

When we consider that the sewers of London, pervading as they do every part of the metropolis, extend to some 1,500 miles, and that almost every house is more or less intimately connected with them, it is plain that their influence, in a sanitary point of view, cannot readily be over-estimated.

Till within the last few years, the ventilators for the sewers were reduced to as small a number as possible, and always placed in the centres of the streets, on account of the disagreeable and dangerous effluvia which, especially in warm weather, these air-holes were too apt to emit. At present, however, these air-holes may be increased to any extent, and placed in any situation; for since the application of the charcoal air-filters to the ventilating shafts of the sewers, the effluvia and deleterious gases are effectually arrested and destroyed, by being subjected to a species of low combustion, which resolves their carbon into carbonic acid, their hydrogen into water, and their nitrogen into ammonia.

The nature and origin of the charcoal air-filter is as follows. It has long been known that the various kinds of animal and vegetable charcoal, especially when dry, possess the power of absorbing effluvia, and the greater number of gases and vapours. The subject was first investigated by M. Löwitz, a German chemist, who, towards the close of the last century, showed that charcoal might be made to deodorize and disinfect most putrid substances. About seven years ago, it was discovered by Mr. John Turnbull, of Glasgow, that when the bodies of dead animals are covered over with a few inches of powdered charcoal, and exposed to the air, though the bodies rapidly decay, not the slightest disagreeable odour is evolved. This result I verified in 1853, by burying the bodies of a full-grown cat and two rats, in about two inches of charcoal powder, and keeping them in my laboratory. The bodies of the animals rapidly decayed, but not the slightest odour was perceptible, nor were any

injurious consequences experienced by any of the eight or nine persons by whom the laboratory was daily frequented. Towards the close of 1853, my attention was first directed to the deodorizing and disinfecting properties of charcoal, and I was not long in discovering that the views which had been previously entertained regarding the action of charcoal were exceedingly erroneous; for instead of acting as an antiseptic, and thereby retarding the decay of putrefying substances with which it was in contact, as had been previously supposed, its action was the very reverse of this. Charcoal, therefore, from the considerable amount of condensed oxygen contained within its pores, amounting to between nine and ten volumes, not only absorbs, but rapidly oxidizes the effluvia and miasmata emitted by decaying substances, and resolves them into the simplest combinations they are capable of forming.

All porous substances, such as platinum black, pumice stone, &c., possess the power of condensing gases within their pores.

The porosity of charcoal is much greater than many persons are aware of. Liebig states, in his "Letters on Chemistry," that the pores in a cubic inch of beech-wood charcoal must, at the lowest computation, be equal to a surface of 100 square feet.

When reflecting on the wonderful power of charcoal as a deodorizer and disinfectant, as exhibited in the cases already described, where, as we have seen, a layer of charcoal not more than two inches in thickness is capable of absorbing all the miasmata from such an extensive source of corruption as the putrid body of a large animal, it struck me that a thin layer of charcoal powder interposed between wire gauze would be equally effective in preventing the noxious effects which too frequently result from the very minute quantity of putrid infectious matter floating in the air of what are generally known as unhealthy situations.

These considerations led me to construct the so-called charcoal air-filter for the purification of the atmosphere, which was first publicly exhibited and described by me at the meeting of the Society of Arts, on the 22nd of February, 1854.*

The charcoal air-filter consists of a layer of charcoal in coarse powder, varying in size, according to circumstances, between a small bean and a filbert. The charcoal is placed between two sheets of wire gauze fixed in a frame, and can be readily applied to buildings, to ships, to the air-shafts of sewers, to water-closets, to respirators, and various other purposes. All the impurities in the air are absorbed by the charcoal, so that a current of pure air alone passes through the filter, and in this way pure air may be obtained from exceedingly impure sources. It is plain that perforated zinc, or a framework of coarse wire filled with larger pieces, and a greater thickness of charcoal, may be also employed, whenever the amount of effluvia evolved is very considerable.

Before the close of the year 1854, air-filters or charcoal ventilators were fitted up both at the Mansion House and Guildhall. They are each of them several feet in diameter, the layer of charcoal being about one-and-a-half inch in thickness. Although six years have elapsed, the charcoal has never required to be renewed, owing to its oxidating power being practically unlimited. Air-filters were soon afterwards largely employed in private houses, in connexion with drains and water-closets particularly, and they were also very successfully applied to the construction of respirators, many thousands of which have ever since been annually manufactured. On the 2nd of March, 1855, I delivered a lecture at the Royal Institution, on the Economical Application of Charcoal to Sanitary Purposes. It was subsequently published by Churchill, and passed through three editions. In it, the preceding and many additional facts were made known to the public.

Some time after the publication of this lecture, Mr.

* See *Journal*, vol. ii., p. 245.

Robert Rawlinson, the eminent engineer, was induced to apply the charcoal filter, in the beginning of the year 1856, to the air-shafts of sewers. The charcoal filters are so arranged, that while the charcoal is kept dry, the whole of the air issuing from the sewer is made to pass through the charcoal, by which all its impurities are retained and destroyed, nothing but pure air passing up into the street. From the extreme porosity of the charcoal it does not sensibly injure the draught of the air-shafts, and by increasing the size of the filters—for instance, by doubling their diameter, or what is perhaps much better, by adding to their number—any diminution of air-way may be easily prevented. These filters, from their simplicity, are by no means costly in their construction, and if kept dry, the charcoal never requires to be renewed.

Mr. Rawlinson has hitherto employed tolerably thick single filters placed perpendicularly. I should prefer using two or more thin filters placed at short distances, say two inches, from each other. These thin filters disinfect the air quite as efficiently as a single thick one, and I think they present rather less obstruction to the air. There is this disadvantage also attending the use of the upright filters, that after a time the charcoal is apt to subside a little, and leave an opening at the top, through which a portion of the air may escape. This, however, is easily prevented by placing a bar of wood or metal, from two to three inches broad, right across the upper part of the outside of the filter. When this has been done, even should the charcoal subside for an inch or so at the top of the filter, no air will be able to pass through which has not been disinfected by the charcoal.

Mr. Rawlinson, during the last four years, has applied charcoal air-filters to the ventilation of sewers on a large scale, at West Ham, near London; at Swansea, Workop, and Buxton, the entire towns; at Brighton partially; at Bowood, the seat of Lord Lansdowne, and at various other places.

In 1858 a very important and able report on the state of the sewers, and the various means which have been proposed for disinfecting them, was published by Dr. Letheby, Health Officer of the City of London, and Lecturer on Chemistry and Medical Jurisprudence in the Medical College of the London Hospital. After a minute and rigorous examination of the various methods proposed for disinfecting the sewers of London, some of which were enormously expensive, those with bleaching powder and permanganate of soda being estimated to cost from 200,000 to 270,000 pounds for a single year, Dr. Letheby strongly recommended the employment of charcoal air-filters, as infinitely the cheapest and most effective of all the plans which had been proposed. About a year ago, therefore, under Dr. Letheby's directions, Mr. Haywood, the engineer to the City Commissioners of Sewers, commenced applying the charcoal filters to the ventilation of the sewers in Shoreditch, and to many of the adjoining streets, which were well known to suffer more from the sewerage exhalations than almost any of the other districts in London. Mr. Haywood employed tolerably thin horizontal charcoal filters, three or four being placed one above the other on a stalk, with short distances between them, the pieces of charcoal being from one inch to an inch-and-a-half in length, and placed in single layers, while Mr. Rawlinson, as already mentioned, employed single perpendicular filters. In both cases the results have been perfectly satisfactory, as the sewer gases are as effectually destroyed by being subjected to a species of low combustion, as if they had been passed through a red-hot furnace. In this process the charcoal is not acted upon by the gases, but acts upon them, as before stated, causing them to combine with condensed oxygen. The efficiency of the charcoal appears never to diminish, if it is kept dry and its pores are not choked up by dust.

The expense of applying charcoal to the disinfection of the sewers is by no means considerable, as the first outlay is all that is required. I am informed that the changes rendered necessary by the introduction of charcoal venti-

lators for the sewers in the extensive district of Shoreditch, have been under £1,000. But had these sewers been originally constructed with a view to the employment of the charcoal ventilators, the expense would have been considerably less.

One great advantage of the charcoal system is, that it enables us to make as many openings into the sewers as we please, and thus prevents any considerable quantity of the gases accumulating at any one point, as they pass up into the filters and are destroyed almost as rapidly as they are formed. Such sewers have, therefore, all the advantages of open drains, without any of their disadvantages. Hence there can never be any considerable pressure on the traps of the house-drains, one of the great disadvantages attendant on the ordinary system of sewers. It is by no means indispensably necessary that the charcoal filters should be placed only in the ventilating shafts of the sewers. The air-holes in the centre of the streets may be closed, if thought desirable, and the gases conducted by means of wide pipes into charcoal filters, placed at the edges of the pavement, or inserted into the walls of the houses. The lower portions of the lamp-posts enlarged for this purpose, or short pillars, like letter-boxes, either standing at the edges of the pavement, or inserted into the walls of the houses, will answer perfectly well. The only precautions to be observed are, that while the filters shall be sheltered from rain and moisture, free access shall be given to the air.

In conclusion I may state, that for the last six years I have strongly recommended that charcoal air-filters should be applied to all house-drains, sinks, and water-closets.

SPECIAL APPLICATION OF THE FILTERS TO WATER-CLOSETS.

Every water-closet, in my opinion, ought to be furnished with a subsidiary pipe branching off from the main pipe, a little below the valve of the closet. This subsidiary pipe should be carried a few feet above the seat of the closet; and its extremity, which should be open, with the exception of a few wires stretched across it, merely to prevent the charcoal falling into it, should terminate in a charcoal filter six or eight inches thick, into which it should penetrate to the depth of two or three inches, so as, in fact, to be enclosed by a good body of charcoal. Under such an arrangement as this, no foul gases can penetrate into the closet, but will be retained and destroyed by the charcoal, into which they naturally flow, as in this direction scarcely any resistance is offered to their passage; whereas, in almost all water-closets as hitherto constructed every time that the handle is drawn up, the water which descends necessarily forces a quantity of foul air into the closet, and this foul air not unfrequently passes from the closet into the other apartments of the house.

From the preceding statements it is plain, that the oxygen contained in the air of the atmosphere is by far the cheapest and most effective deodorizing and disinfecting agent with which we are acquainted, and that the usefulness of the charcoal air-filter consists in its affording a safe and advantageous means of applying atmospheric air to disinfecting purposes.

I think it but justice to myself to state that I have no pecuniary interest in the charcoal air-filter. Though strongly urged to do so, I refrained from securing it by patent, on the ground that inventions for the prevention of disease and death ought to be sold at the lowest possible price; and should not, therefore, be encumbered with the expense and restrictions attendant upon patent rights.

Dr. Letheby, in a letter to Dr. Stenhouse, dated Dec. 11, 1860, says:—In reply to your question, as to the efficacy of the charcoal ventilators which have been put down in the City of London for the ventilation of the sewers, I can give you a satisfactory account as far as our experience has yet gone.

As you are aware, in my report on the Ventilation of Sewers, in September, 1858, I recommended that an expe-

periment should be tried on a large scale with the charcoal, as a means of destroying the noxious gases which, in their passage from the sewers into the public way, were so constantly a source of annoyance and danger. Relying on the practical facts which you had already made public, as to the powerful disinfecting action of charcoal, I had no hesitation in recommending its use to the Commissioners of Sewers of this City. Acting on this advice, their engineer, Mr. Haywood, put a large district of the City under treatment. He selected the worst district in his jurisdiction, namely, the eastern division of the metropolis; a locality densely populated and inhabited by a very poor class of persons. The area of the experiment is about fifty acres; it has about seventeen hundred houses and 14,500 inhabitants. It is completely isolated, and every opening for ventilation has been provided with a charcoal air-filter. In this way 103 filters have been put down; and although the sewage of the district is extremely bad, yet no unpleasant effects have been observed, either in the atmosphere of the sewers or on the outside of the ventilators. No hindrance has been offered to ventilation, so that the men can enter the sewers as usual, and the air-filters have completely arrested the flow outwards of the foul gases, so that no offence or annoyance is now observed, except at the gully openings, which have not been provided with charcoal filters. The experiment has been progressing during the whole of the last summer; and although the season has not been so warm as usual, yet the results are sufficiently satisfactory to warrant us in expecting the most complete success.

I may further add, that one of the charcoal ventilators was put up about two years ago, in a locality where the escape of the sewer gases had been the source of great annoyance and injury to health; and notwithstanding that it has been in action for two years, yet it is still as perfect as ever; nothing having been done to it during the whole of that time. It has acted most efficiently in the destruction of the noxious gases.

I am of opinion, from all this, that the employment of your charcoal air-filters will be found of the greatest service in every large town where the sewers must be ventilated.

Mr. William Haywood, Engineer to the City of London Commissioners of Sewers gives a similarly favourable opinion.

Mr. Robert Rawlinson, C.E., says:—I have applied this mode of sewer ventilation on a large scale at West Ham, near London; at Workop, at Swansea, and at Buxton, (the entire towns); at Brighton partially; at Bowood, the seat of Lord Lansdowne, and at other places. I shall never, in future, execute any sewers or drains without the intervention of charcoal-boxes to burn off the gases at the points of outlet.

The entire system of sewers in Workop is fully ventilated by special arrangements for this purpose, at fifty-one places, and these include all upper ends of sewers.

There are side-chambers having screens of charcoal intervening, through which any sewer gases must unceasingly flow; and Dr. Stenhouse has proved that such gases are oxidized by contact with the charcoal, so as to render them innoxious.

The process is silently carried on, continuously, and at very little cost. A few shillings per annum to renew any charcoal which has become wet, and to cleanse out the ventilating shafts from road dirt, which may have worked through the surface grates, by the road traffic above, is all that will be required.

Up to this time, I have put in use upwards of four hundred charcoal ventilators in sewers executed, and shall continue to use them in future. No sewer should be allowed to be without adequate means for ventilation, and most certainly no ventilator should be without the arrangement of charcoal proposed by Dr. Stenhouse.

ACCLIMATISATION OF THE ALPACA AND VICUNA IN AUSTRALIA.

The following are extracts from letters from Mr. Charles Ledger to his brother in this country, who, it will be remembered, read a paper before the Society on this subject* :—

Sydney, March 15th, 1861.

In continuation of my last, and redeeming the promise then given, I at once give you some information respecting the alpaca, llama, &c. You must bear in mind that I only write from my own experiences, conjectures, &c.

All writers on the alpaca are unanimous in asserting that the cross between the alpaca and llama is a mule, or non-reproducing animal. I maintain that it is a class of the same species, in the same degree, as Cotswold's, South-downs, merinos, &c., in sheep. The error of the theory as to the sterility of the cross breed, and its being a barren animal, I set at rest, to my own satisfaction, so far back as 1848. I have at the present time, in the flock imported by me, a large number of animals in 1st, 2nd, 3rd, 4th, and 5th cross.

1st,	from female Llama and male Alpaca, both pure in their class.
2nd,	" product of above and male Alpaca.
3rd,	" " of 2nd cross and "
4th,	" " of 3rd " "
5th,	" " of 4th " "

I have not a single entire Llama in the flocks, neither have I ever had. All cross-bred males I have "cut" before attaining the age of six months.

The word "machorra" is half-Spanish, half-Imarra (Indian), derived from *Macho*, Spanish for male, and *Horra*, Ymarra for barren, contracted into "machorra," and meaning "barren as a male."

In many parts of Peru, I may say in all the cities of the coast, the word "machorra" is applied to llamas in general. "See the machorras!" "Machorras are passing!" "I met a flock of machorras!" is well known to refer to llamas. A barren mare, cow, sow, ewe, or even woman, is generally (perhaps vulgarly) called a "machorra" by the Spanish Peruvians, and "horra" by the Indians. The verse that Walton quotes, at page 29, in apparent holding of what he advances, is foreign to the question, and refers to another subject. Its translation is literally as follows, "And his barren ewes come to fruitfulness, by which his gains are doubled." If, then, as here stated, the "machorras" become fruitful, the theory of Walton, by his own illustration, must fall through. Cervantes, in his "Galatea," sings songs in praise of the fruitfulness of the pastures he is speaking of, extols their abundance, and perhaps exaggeratedly claims for them a prolific effect. It is nothing new, either, to find in all animal nature that change of climate, food, and locale, often produces fertility after a lengthened period of sterility. There are several other points sustained by Walton in which I cannot agree with him, although I fully agree that he only reproduces the opinions of writers prior to himself. His work is a useful one, and did much good in its day. Turn to page 144, and laugh at what is there said. Is it possible, I ask as I often did myself years ago, on hearing so generally sustained the opinion there stated as to the extreme difficulty of procreation in the Alpaca and Llama, can all-wise and provident nature have been deficient in this single item of her wonderful creation? I thoroughly deny the truth of such an absurd assertion; my own experience proves the contrary.

* * * * *

The successful acclimatisation of the alpaca and llama in New South Wales is now placed beyond a doubt; a few more years of careful and devoted dedication to their proper crossing until every trace of the llama is eradicated, will open up a fecund and most valuable, permanent, and increasing source of wealth to this country. I cannot here omit calling your attention to what I consider of importance and well worthy the attention of the

* See present vol. of *Journal*, p. 212.

Society of Acclimatisation, the Government, and people of India. The proximity and easy short communication between Australia and India is well-known; and, by what I read, there are many parts of that country in every way suited to this animal. In the Presidency of Madras, I find that "Ootacamund is 7,000 feet high, the hills and level table lands are covered with short, sweet grass, mixed with heath and thyme, also Alpine gentian, which affords the best possible pasturage for the sheep and cattle of the Todahs. The range of temperature is from 25 to 69, and the mean annual temperature 56 of Fahrenheit," (see *Household Words*, March 20th, 1858, page 18, 19, of vol. 17,) the same temperature as in the largest alpaca wool producing provinces of Peru, and the climate, productions and people seem identical. How easy it would be to introduce the alpaca from this country to India, and indeed, I am certain, the idea is worthy of being entertained by the Government, a company, or a private individual. Let the experiment be made with, say 12, or 10 females and 2 males; I am sure the Government here would not object to my disposing of that number for such object; what immense results might not this small beginning lead to, and what great advantages might not Australia reap in course of time from interchange of males and reciprocal information as to the animal itself. Our late governor, Sir William Denison, is the present governor at Madras; he took a lively interest in the introduction of the alpaca here, as in everything else that promised to be of use to the colony. I will write to him on the subject. In the meanwhile I think you might bring the suggestion before the Society of Acclimatisation, the public, and individuals. There would be no necessity for any great expense; I offer most willingly to supply the animals, (with permission of Government, of course), select those fitted for the journey, attend their shipment, and further send some one in charge of them. I, too, would readily furnish all and every information on the subject, being only too proud of the opportunity of being useful to my fellow creatures. Were it thought desirable for me personally to accompany the animals and see the country, I would do so with alacrity.

It was my intention to have presented myself before the public as author of *Twenty-four Years Residence in South Australia*, and a *Narrative of the Alpaca Expeditions*. After much thought, I am afraid to venture on carrying out my first intention, the subject is too vast, and one that I am aware is beyond my capabilities, unless I were content to satisfy myself with the meagre, superficial and erroneous conclusions arrived at by every writer I have read respecting the country, people, their customs, Government, &c., &c. This I would not do. I therefore will confine myself to writing out from journals a "narrative of the alpaca enterprise," adding a few chapters on the animal, its breeding, &c., accompanying the sketches that I have, taken by Mr. Savage during the journey, with portrait of self, Mr. Savage, and my famous Pedro. The last of my men are now returning home, after 7 to 8 years of most faithful and exemplary attachment to me. Without them I could never have carried out my project, under strong temptations of pecuniary reward, the immediate possession of my flock, mules and baggage by the Bolivian authorities, if would desert from my service; which had they done, I should have been forced to abandon the expedition, had I succeeded in escaping from being killed by them, or delivered up to my persecutors; either one or the other would have been easily done had they been induced to the first step. I cannot express my feelings adequately on this subject, and I lament more and more that I am unable to in any way requite as I ought, and would desire to do, their unflinching courage, cheerful endurance of hunger, thirst, cold, inclement weather, risk of life on many occasions, their devotedness to me, and finally their readiness to leave their own country with a "White Man" akin, as European and stranger, to the hated conqueror and destroyer of their race, their traditions, and their ever-lamented and well-cherished (in traditional remembrance) Yncas.

Indeed, the readiness to accompany me is without precedent in South America, and called forth the surprise of all Europeans, on the West Coast, in anyway acquainted with the character of the Indians, in greater degree than my successfully shipping the animals. The poor fellows are anxious to see again all that are near and dear to them; they long to return to their mountain homes, and be among their kindred, and those speaking their language, holding their habits and customs, and they are right. I am pleased to see them so, although sorry to lose them after so many years being with me. They have been frugal and economical, have saved a large sum (for them) out of their wages, some of them have £60, £50, and £40. I am sadly afraid they will meet with persecution on their return, from the minor authorities of their districts for their faithfulness to me. In fact, of those that went home last year, some had been impressed as soldiers on arriving, and the others had to purchase their freedom by bribing the authorities not to molest them.

* * * * *

I know too well the folly of believing any word of the theory obtained from the Indians. It is their glory to deceive the "White Man," the lesson they learn from birth.

The Indian of Peru acts on tradition, and will admit of no innovation in his treatment of this animal. I should have most willingly, for sake of peace, have accepted his traditions as authoritative facts, had I not been forced to change my tactics by every Peruvian Indian leaving me in disgust, thoroughly satisfied that I was conducting my flock to certain destruction by my management of them, compelled thereto by circumstances beyond his comprehension. He could not understand the necessity of my hasty driving, neither could he admit the obligatory ramble through a country all but barren, or allow for a moment that any specifics but those used by his forefathers could possibly avail in the cure of disease; perhaps the greatest difficulty I had to surmount in prosecuting my enterprise (the want of money at times being only greater) was the continued clashing of my orders with their superstitious veneration for their prejudices."

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The vicuna has a lamb to male white alpaca—a beautiful little thing it is, a curiosity in Natural History.

The animals are all thriving well, and giving rise thereby to unlimited hopes. The future, I feel confident, will make amends for the past.

EXTRACTS FROM THE REPORTS OF H.B.M. CONSULS.

(Continued from page 225.)

EXPORTS OF THE REPUBLIC OF HONDURAS. — Horned cattle is, next to mineral produce, the greatest staple of Honduras, and a large trade is carried on every year with Guatemala, Salvador, and Belize. Exclusive of the large herds which are driven directly to the markets of those States, and of the exportations to Belize, there are at least 12,000 head of cattle taken every year to the three fairs held at San Miguel, in the months of February, May, and November, which are there sold at prices averaging eight or ten dollars a-head. However, in the year 1855, as I have said, no cattle was taken to those States by reason of the revolution; and, in the November fair, owing to this circumstance, the cash returned only to Guatemala, uninvested, amounted to no less than 80,000 dollars.

Mahogany ranks third in the exportations, and there are years in which the value of this article far exceeds that of the others. The cuttings are chiefly established on the valleys bordering on most of the large streams flowing through the departments of Santa Barbara and Yoro. On these streams the logs are floated down to their mouths, where they are shipped to England in vessels from 400 to 800 tons. As the cuttings lie mostly in the lands of the State, contracts are entered into by the cutters with the Government, wherein they stipulate to pay the

revenue a certain sum for every tree that is felled, generally from five to ten dollars. The labourers are chiefly Negroes and Indians, divided into gangs of fifteen to thirty each, and the trees are generally cut at twelve feet from the ground. The season for cutting commences in August, and lasts until winter sets in, previous to which the stumps are counted by the Government officials, setting a mark on each, when it is seen how far the cutters have gone, and the adjustment of accounts take place. There are, besides mahogany, many other precious woods in Honduras, but of those only the rosewood is exported to a limited extent.

Tobacco.—The tobacco of Honduras is by far the best in Central America, and it is cultivated chiefly in Gracias, where it is produced of a quality fully equal to that of Cuba. To this island a considerable quantity is taken every year, where it is manufactured and exported as the produce of that country. The Department of Gracias carries on a large trade with Guatemala and Salvador in this article, but it is impossible to estimate the yearly value of it, depending mainly, as it does, on the state of public tranquillity and that of the political relations with these States. A large quantity is also exported every year to Germany and other places, *via* the Pacific, but it is alike impossible to learn its amount, as, indeed, it is of all the commerce which flows in that direction, from the circumstance of that custom-house being in the hands of private parties.

The cultivation of indigo has been introduced of late years in Gracias, in the valley of the Chamelecon River, and in the western part of the Department of Comayagua, with very favourable results, it having been found to equal, in every point, the best produced in Salvador. Its production, however, is as yet very confined, although there is no doubt that in the course of time this article will form one of the chief items of exportation.

Cocoa and coffee are cultivated in Honduras, both of them of very good quality, and the first article particularly, is quite equal to the best produced in Nicaragua. Their production, however, is not even sufficient for the home consumption, and consequently a great portion of the supplies of these articles is brought respectively from Nicaragua and Costa Rica.

MINES AND MINING IN THE REPUBLIC OF HONDURAS.—Although mines constitute the principal source of wealth in this Republic, little can be said on this topic, owing to the want of any statistical information, and to the neglected state in which this, as well as every other other branch of industry, has been suffered to remain. There is no doubt that when a development of the latent resources of Honduras begins to take place, mining will be the most interesting and important pursuit on account of the abundance and richness of the metalliferous veins which are found in various parts of her territory. The amount of the mineral products of Honduras may be estimated at from 200,000 to 300,000 dollars worth a year. As there is no tax levied on the exportation of the precious metals, it is not possible to ascertain the exact value it amounts to, but I think the above figure is the most approximate estimate of the annual average value of these products, all of which are taken out of the country, there being no Mint in the State, and the use of gold and silver wrought articles being very inconsiderable. In the latter times of the Spanish dominion, the mines yielded, according to the best authorities, on an average, from two to three millions of dollars a year. This productiveness was the result of the state of quiet which was enjoyed then, but since the emancipation from Spain the long series of revolutions which have devastated this country have been gradually diminishing the importance of mining, until it has dwindled to the comparatively insignificant state in which it is at present found, a condition which has been brought about solely by the agency of war, seeing that all the mineral districts are, with the exception of a few old mines which have been worked out, in a virgin state. Even as it is, the precious metals constitute, as I have said

before, the principal item in the exportations of this country; although, as may be supposed, the system by which this produce is raised, without proper machines for draining the mines, or for extracting, crushing, and reducing the ores, is a very rude and defective one. There is a multitude of mines of acknowledged richness lying in an abandoned state from the inability of the inhabitants to work them, whereas, if operations were to be established on a judicious and proper plan, they might be made to yield large profits. Properly speaking, there are few gold mines in Honduras as yet discovered, but gold occurs abundantly in some of the rich silver mines, in most of which, in fact, the silver is found in combination with gold, iron, lead, zinc, antimony, mercury, sulphur, &c. Most of these mines are situated along the chains of mountains which lie on the Pacific slope, while gold dust and some gold mines are to be found on the Atlantic side.

Gold, according to all accounts, is found in great quantity, and of the best description, in the beds of all the rivers which flow into the Atlantic, and the washings in these *placers* are represented to be highly remunerative. Men and women employ themselves during certain portions of the year in gold washing, and they sell the gold dust at from 11.50 to 12 dollars the ounce. By far the greatest quantity of the gold exported from Honduras is raised in this way, from the rivers Guayape, Jalan, and Manguile, in the Department of Olancho, where it is found of the purest and most excellent quality, as likewise in those of Yaguale, Sulaco, Pacaya, and Caimito rapids in Yoro. Minas de Oro, a village on the northern part of the Department of Comayagua is, as its name implies, situated in a particularly auriferous district, the precious metal being found not only in veins of a very rich character, but also in beds and fragmentary deposits along a number of streamlets and small rapids flowing into the Sulaco River. In this district are situated the copper mines which furnish all the metal used for the mintage of the "provisional" currency, and gold is here also found to exist in a considerable proportion, as has been found by washing the dust obtained in the process of bruising the copper ores. There are also some very rich copper mines in the Department of Santa Barbara, and a wealthy and intelligent native is about to establish operations for working them, with a view of exporting the metal, a scheme for which the proximity of the rivers Sulaco and Humay offers great advantages, both running to the Ullua River, which discharges in the Atlantic a few miles from the Port of Omoa. There are also some rich copper mines in the Department of Choluteca, situated near the ridge of mountains running along the coast, a circumstance very favourable to their exploration.

Opals form another important item of the Honduras mineral riches; there are a great number of mines in the Department of Gracias, and many of these precious stones are exported every year, the value of which is, nevertheless, inconsiderable, from their being sent in their rough state. There is, however, a French miner and lapidary working a mine at Erandique, who is reported to be realising a large fortune by exporting polished opals.

Iron ores are also abundant; but only one or two mines are being worked at present, and the little iron produced is scarcely sufficient for the home demand. The following metals and minerals are found in the State:—Coal, limestone, platina, zinc, tin, amianthus, cinnabar, &c., but as yet nothing has been done to bring about a proper exploration of these riches. The arts of peace being all but ignored in Honduras, the precious metals have absorbed all the attention of those that have devoted themselves to mining pursuits. The Government has at various times tried to give a stimulus to mining by securing certain privileges to persons engaged in this branch of industry. By a decree dated March 16th, 1843, mine proprietors were allowed to work their mines as they thought best, thus abolishing the old restrictive Spanish law which enjoined mining operations to be conducted on a given and unprofitable method. Decrees have at various times been

passed, exempting men engaged as miners from military service. These laws have worked out very well in times of peace, but the moment a revolution breaks out, they are invariably disregarded by the military authorities. In consequence of the insecurity arising from these perpetual wars and other drawbacks, such as the scarcity of labourers, the want of capital and scientific appliances, the natural indolence of the Spanish American race, and the total want of roads for the conveyance of machinery adapted for the proper working of the mines, most of the enterprises which have been established, involving an outlay, have met with signal failure; in some of these, foreigners have been engaged, and foreign capital invested; but at present all the mining is in the hands of the natives, with two or three exceptions; one of them, the Cuyal mine, situated at a few leagues from the Pacific, is worked under an association formed in London, called the Cuyal Mining Company; but as yet the operations in it cannot be said to have been properly established. From the richness of the mine (yielding from 70 to 3,245 ounces of silver per ton) and its local advantages, this undertaking, if properly followed up, will no doubt turn out a very profitable one. There is another mine in Tegueigalpa, called Guasueuran, worked by an Englishman, which yields the enormous proportion of from 200 to 8,000 ounces of silver per ton.

COPPER MINES.—Copper mines, which are numerous and rich in the State of Sinaloa, Mexico, have hitherto but slightly attracted the attention of British capitalists. Although for some years past Mazatlan copper has been known in the English market, until lately no steps have been taken to ascertain, by local investigation, what facilities there were to increase the supply. The district of country in which copper mining is carried on has lately been visited by professional Englishmen, having a technical and practical knowledge of the subject, and their report is exceedingly favourable, both with respect to the number of mines met with, the description and richness of the metal, and the facilities for working it; the latter is greatly aided by the different classes of ore obtainable, which, combined, assist each other in the smelting process, and a suitable flux has also been found near the copper-mines examined. The principal mine now worked is that of "Jesus Maria." The smelting has hitherto been carried on in a primitive manner, in small ovens, supplied with bellows moved by men. The copper left in the slags, through imperfect reduction, is estimated at ten to twelve per cent. The lode is described as very rich, and from twenty to thirty yards wide. At the period of the visit of the persons alluded to, about 2,500 tons of ore were ready for smelting, of an average richness of thirty per cent., and in another part of the works about 1,000 tons of sixty to seventy per cent. ore were visible; the latter was composed of grey ore, with large spots of native copper, and black oxide, and some crystals of the red oxide; the other portion of the ore was found to contain green carbonate, sulphurets of copper mixed with iron ore, and some crystallizations of sulphate of copper in the rich brown copper; the whole lode may average from fifteen to eighteen per cent. The other mines examined in the same range of the Sierra, though they vary in quality, present the same characteristic appearance as the one described. The principal drawback to the working of the copper-mines in this district is their distance from the coast, and expensive mule carriage being incurred in transporting the copper thither, the distance being about fifty-five leagues, and the expense of mule-hire two dollars to two and a-quarter dollars per quintal. Nevertheless, if the present rude operations give returns sufficiently encouraging to induce the proprietors to continue working the mines, it appears a fair subject for the consideration of capitalists whether the application of the improved methods of smelting and refining practised at Swansea, would be attended with results sufficiently profitable to warrant the investment of the capital necessary for the erection in this country of suitable smelting works, and of

sending out a staff of English miners to direct them. The facility of shipping the copper to Great Britain is very great—the vessels which load Lima wood readily receiving it for ballast. The rate lately paid has been 40s. sterling per ton.

Home Correspondence.

THE NATIONAL PORTRAIT GALLERY.

SIR,—The Society of Arts is now stirring to promote the extension of Art-galleries, Museums, and Libraries. I therefore address myself to you on the subject of the National Portrait Gallery, with the assurance that through your *Journal* a large class of interested and influential readers may be reached.

Great interest has always been felt in the success of this Gallery, and the expectations of the public have been fed by paragraphs sent the round of the press, announcing, rather ostentatiously, from time to time, valuable acquisitions by gift or purchase. These I had long been anxious to see, when, stimulated by a recent perusal of Lord Stanhope's speech in 1856, which led to the formation of the Gallery, and the announcement in the newspapers that the Gallery would be open during the great holiday week, I determined to be among the crowd on Whit-Monday, and after a long walk on the morning of that day, I wandered up and down Great George-street to find this National Institution, but in vain. On a closer examination, however, I discovered on the door-post of a house, having, in every respect, the appearance of a private dwelling, a small, a very small, bell-plate, with the announcement, in Lilliputian letters, that "The National Portrait Gallery is open only on Wednesdays and Saturdays after 12 o'clock." After some hesitation, on venturing to ring the bell, I was civilly informed that Whitsuntide made no difference, but that I should find the Gallery open as announced, on Wednesday.

I was disappointed, I own, and I took some pains to renew my visit on the day appointed. This time I found a moveable board hung upon the railings, stating that the Gallery was open from 12 o'clock to 4 o'clock, free. The door was thrown open, a policeman was at the entrance, a *commissionnaire* received my umbrella in one hall, a second policeman on the first-floor pointed out the room I was to enter, and a clerk in the room asked me to add my name to his bare list. On the dark landing of the back and front staircase, and in three small, low, dark, unsuitable, ill-arranged rooms, I saw the results of four years' money and labour in the establishment of our National Gallery for British Portraits.

It was the middle of a fine day in the great holiday week, and I made the fourth visitor in the Gallery, so we were provided each with an attendant. This, then, at a glance was the institution which was "to afford not only great pleasure, but much instruction to the industrious classes;" which was, also, "in a special degree to be a boon to men of letters," and, continuing to quote Lord Stanhope, "an additional incentive to honourable emulation in the performance of great deeds." And all this it should be, and may still be; yet anything more slow, dull, hopeless, and depressing for a young public institution than this exhibition in Great George-street, can hardly be conceived.

On looking into the contents of our intended British Pantheon, matters did not improve. Reckoning paintings, drawings, miniatures, and busts, about 122 works are exhibited, the majority of them quite invisible to minute examination and criticism. Of their art value, some opinion may be formed by the information labelled upon the frames of about one-third (it is difficult to be more exact, as some in high and dark corners are illegible) that the artist is unknown. Perhaps ten could not be selected with much pretension to be classed as works of art. Nor is the whole collection on a much higher scale, as representing persons

of great historic interest or celebrity. The most select works appear to be hung in the front room, which is the most spacious, and has the best light; and of the thirty-five pictures which this room contains (excepting the Chandos Shakspeare portrait), looking at them with an eye to Christie's present high hammer prices, £10 each would be a very liberal average of what they would fetch, even if they are correctly named, which seems open in some instances to much doubt. By lists hung up in the rooms, there have been 36 donors, some of whom have given more than one portrait to the collection, so that about 80 works such as I have described have been acquired by purchase since 1856. I speak with sufficient accuracy; I would have been more exact, but it seemed too bad to submit to the exaction of one shilling and sixpence, demanded in a public gallery, for a catalogue of only 120 works, and I mention this as one significant fact of unfit and inefficient management.

This was all disheartening and dispiriting enough, and I grieved over the short-sightedness of "John Bull," who has the character of holding tight his purse-strings when such luxuries as pictures and public galleries are in question. I feared, from appearances, that even the £500 per annum, with which Lord Stanhope proposed to carry out his excellent idea, had not always been granted. I found out, however, on further inquiry, my great mistake, and that the sad shortcomings I had witnessed could not be attributed to public parsimony. In the Civil Service Estimates, 1861-2, class 4, Education, Science, and Art, No. 13, a vote of £2,000 is proposed for the British Historical Portrait Gallery, unaccompanied by the slightest information of any kind whatever, except incidentally the important fact, that a similar sum was voted for the previous year; and in striking contrast to this unexplained demand, there appears in the same document the votes for the National Gallery, the Kensington Museum, and the British Museum, accompanied by the most detailed estimates of salaries, wages, and purchases of every class and kind, with reports of the progress of these really great national institutions, the numbers of their visitors, students, and, in fact, everything that the Parliament or the public would desire to know.

A few calculations soon showed why it was prudent that all such knowledge should be withheld in respect to the National Portrait Gallery; what amount of advantage the public receive from it; in what way the large votes made for its support are expended; why, in fact, "no questions should be asked." As is announced, the gallery is open to the public from 12 to 4 o'clock on two days in each week. Assuming that it is closed for six weeks in the vacation season, the public are then admitted for 368 hours only in the year, which, calculated on the sum of £2,000 voted, costs the public £5 10s. per hour; and, as the result of my experience would give an average of about 5 persons per hour, or twenty per day, which I believe to be a full average, then John Bull, whom I was too prone to blame, most liberally votes about 20s. for each visitor, and each visitor pays one shilling and sixpence for his catalogue, if he desires to avail himself of its instructional advantages. This is costly inspiration in art and patriotism to be provided at the public charge. Then, as to the value of the collection which has been made. Can any competent person be found who (omitting the donations) would estimate it at one-third the money voted for the maintenance of the Gallery in the two last years only?

Extraordinary as these statements may appear, I fear that they approach very near to the truth. With the greatest interest in Lord Stanhope's great project, I have looked at the gallery with no prejudiced eye, and do not believe at the time under any dyspeptic influences. If the facts here assumed, in the absence of any due official information, are incorrect, such information can be, and should be, at once given on sufficient authority, that they may be refuted. This is due to the public. The opinions must be taken for what they are anonymously worth, but they

would prove on further investigation by no means singular or unsupported.

Then the question arises still, in the absence of all proper information, how is the voted money spent? The Commissioners, about twelve persons of distinction and eminence, fill honorary offices. They cannot, and certainly do not, receive any part of this money. The four attendants are of a class usually employed for such purposes, and paid by the hour, and for them, with a female to clean rooms used for eight hours in the week only, not probably much more than £100 a year would be expended. Then there is a secretary, whose duties must be nearly a sinecure, consisting, perhaps, of some general superintendence, the business at the present slow rate of progress, which refers to the purchase of about twenty portraits in the year, and the acceptance in some courteous terms of about half as many more. He must be well paid if, with the staff enumerated, he makes much hole in £2,000 per annum. But there is a handsome house in Great George-street, the privacy of which is secured by the contrivance for removing the notice board, maintained, warmed, and lighted at the public charge, and of which the public have a partial use for full eight hours in each week. And the secretary, as appears by the Directory, is so fortunate as to enjoy the use of all the remainder. The secretary's salary, and his residential charges, will account for a good slice out of the vote, and the purchase of about twenty portraits of the value already estimated, must exhaust the rest. Perhaps, if we had better information, the whole affair would not have so much the appearance of a snug little job.

How long can such a state of things continue? The whole management seems in a hopeless stagnation, and, without meaning the slightest personal reflection upon anyone, it is quite clear that upon whomsoever the real management falls, the right man is not in the right place. The rooms in which the collection is placed, and the locality, are perhaps partial causes of this want of success—this snail's-pace progress. Lord Stanhope assumed that the collection would be greatly increased by presents. But how is this to be expected. Who would consign a fine picture, the valued portrait of a renowned ancestor, to such a burial place? The present rooms were only intended as a temporary place of deposit, the present arrangements as entirely provisional. The true reform, and the true economy, will be found by putting an end to them at once by withdrawing the present vote for £2,000, and saving the greater part of that sum in the wasteful, useless charges for a separate establishment, retaining only the Commissioners, who, as an honorary body of advisers, would still give useful assistance.

But what is then to become of the collection of portraits? It was originally proposed that they should be added to the National Gallery. Move them then at once to South Kensington, where an interesting part of the National pictures have now found a most suitable locality. There ample space exists, and room for all necessary expansion. There, under the charge of most competent officers, who in what they have already accomplished have given such visible proof of their active public spirit, the collection of portraits will receive a development as prompt and interesting as up to this time it has been sluggish and costly; and there its visitors will find access early and late, and be counted by thousands. At South Kensington, too, there are already a number of very fine portraits. I have counted above thirty, the greater number of which may be classed in the arrangement of the galleries as part of the portrait collection. What an addition Copley's "Death of Chatham" would prove, Lawrence's "Mrs. Siddons," Reynolds's "Lord Heathfield," "Lord Ligonier," "Sir William Hamilton," Hoppner's "William Pitt," and others. Then, why may not some other collections find an appropriate resting place here? There are in the Eastern Zoological Gallery of the British Museum above 120 portraits, many of them works of fine-art and of high historic interest, but they are evidently in the way and placed high over the cases and quite out of sight. Move them to South

Kensington. Our country is as rich in historical portraits as it is in its unique records, and if a suitable gallery were provided, how many would at once find their way to form part of a really great national collection? We may be told of insuperable difficulties. I do not believe in them, after what we have seen accomplished at South Kensington. I do not think that they would long stand in the way of zealous museum officers. I am, &c.,

S. R.

ECONOMIC HISTORY OF PARAFFINE.

SIR,—In my paper on this subject, read before your Society on the 20th March last, and reported in your *Journal* of 22nd March, it is stated (p. 297) that “Mr. John Thomas Cooper, the consulting chemist, in 1847, prepared paraffine oil, lubricating oil from paraffine, and paraffine itself, from the distillation of coal.” On further examination of the evidence, I think it is clear that Mr. Cooper did not, in 1847, employ bituminous coal, but Kimmeridge shale, in obtaining these results.

I am, &c., CHAS. TOMLINSON.
King's College, June 11, 1861.

THE FIBRE-YIELDING TREE MALLOW.

SIR,—There is a tree, which is plentiful in Colombia, South America, the Coquita, the bark of which yields a fibre of great strength, which is commonly used there for manufacture of ropes, which are very durable, and sold at a trifling rate. Cables made of it have been found to last longer than hempen ones.

I am, &c., G. H. COUNTZE.
42, Duke-street, St. James's, June 8th, 1861.

Proceedings of Institutions.

GLASGOW INSTITUTION.—The third annual meeting of this Institution was held on Monday, the 27th ult., ALEXANDER STRATHERN, Esq., Sheriff Substitute of Lanarkshire, in the chair. The Hall was completely filled. The meeting having been opened with prayer by Mr. McKellar, the learned Sheriff said, they must keep in view that this Institution, humble though it may be thought, offers as high advantage, to those who seek to be benefited by it, as the proudest of our Universities and our highest Academic Institutions. It ought to be a subject of congratulation to every lover of his race to know that even the sons of toil may, after their day's labour is past, see an opportunity of improvement, and emulate, nay, even excel, those with far better worldly advantages. The learned Sheriff went on to encourage the students, successful and unsuccessful, to persevere, and the latter above all not to lose heart. He also alluded to the satisfactory progress of the Institution, it having increased from 737, in the year ending in May, 1860, to 1,006 in this year. He then called on the Secretary to read the Annual Report, the more prominent parts of which were as follows:—It commenced by stating that the Institution was formed, not from choice but necessity, to afford the means of instruction in all branches of an English commercial, scientific, literary, and Scriptural education, especially to those so engaged during the day as to prevent them from studying what they may desire, and also for children of the same class, and on the self-supporting principle; that it is, in fact, an Industrious People's College. The Report then went on to enumerate the number of individuals who had attended each class during the past year, the aggregate of which was:—On the roll May 10, 1860, 337; and admitted since, in the day classes 71, evening classes 598; total, 669, making the number of individuals who received instruction within the year 1,006. About 22 per cent. attended two or more classes. The present numbers on the rolls are, day, 106, evening, 211; total 317. The number of tickets sold was 1,825, but

from that no inference whatever can be drawn concerning the state of any Institution, unless the price and term of the ticket were well known. After disposing of some minor matters, the Report then went on to state that at first 69 candidates (73 papers) gave in their names for the Preliminary Examinations of the Society of Arts, and 14 for those of the Local Board. Of these, however, only 42 of the former and 10 of the latter came forward, and 28 of the former and 8 of the latter passed; while 27 candidates (28 papers) came up to the Final Examination, and 4 for the Local Board. A much greater number was expected on account of the increased number of students, but the directors, having full confidence in the ability and zeal of their teachers, think this a strong proof that the students and scholars really belong to the class for which the Institution is intended, namely, that portion of the industrial classes whose education requires to be brought up to the passing point rather than those already educated. The pecuniary affairs stood thus:—Income, £384 1s. 8d.; expenditure, rents, taxes, advertising, and all other expenses, £115 8s. 1d.; and salaries to teachers, £268 13s. 7d. The members and students were then congratulated on being able, from this time, to meet all under one roof in a commodious building, 37, Cathedral-street, which they are to have entirely to themselves. Records of thanks to the examiners, teachers, and others, with special reference to the Mutual Improvement Class, and also to the Directors of the popular classes of the Andersonian University for admitting students of this Institution to read from their library, on moderate terms, formed the next part of the Report. It then noticed the Examinations of the day classes by a Committee of the Local Board (who are the authorised Inspectors of all the classes), the result of which was, the passing of 25 as competent to receive Local Board certificates of different grades. These certificates, together with those granted to students, 59 in all, were then presented to the successful candidates by the learned chairman, who had a few kind and pointed words for each as he placed the certificate in his or her hand.

SALFORD WORKING MEN'S COLLEGE.—The third Annual Report of the Council states that the tenth term of this College has concluded, and although in the last report, the council considering that sufficient data had been obtained, ventured to form favourable conjectures as to the probable future of the College, the experience of another year has much more than justified the highest anticipations therein expressed. The progress of the Institution has been most satisfactory. Term by term, the number of the students has increased, the average per term for the year 1859 being 164, and that for 1860, 225. The rapid and yet uniform advancement of this Institution, devoted as it is exclusively to education, tends to show the soundness of the principles upon which Working Men's Colleges were originally projected, and to prove that if instructors will meet working men, as men engaged in the pursuit of knowledge on its own account, they need not fear the want of eager and willing pupils. An interesting feature in the history of this College, young as it is, and one which must ultimately have an important influence in consolidating and giving permanency to the Institution, is that the young men who have been trained within its walls, are becoming energetic teachers, so that different sections of the several classes are by this means being formed, to meet the various stages of the progress of pupils. In the last annual report, reference was made to the union of the College with the Society of Arts, and to a Local Educational Board for the district then in course of formation. This Board is now duly constituted, and its formation will enable all those members of the College who are sufficiently qualified, to obtain the certificates of merit, annually awarded by the Society, or to compete for its prizes. The possession of these certificates and prizes, (the report says) will be of great advantage to their possessors, inasmuch as they are universally acknowledged as an undoubted guarantee of proficiency in the several

branches of education to which they respectively refer. They will also be an assurance to the student, that the knowledge he possesses is of so sound and comprehensive a character, as to be depended upon in his further and higher researches. From the Local Board also, consisting, as it does, of gentlemen fully able to guide and promote educational movements, much advantage may be expected, from the advice which it will be its duty to give to the Council. The examination of the pupils being under its superintendence, the merits and defects in the mode and character of the instruction afforded by the College may fairly be reviewed and advantageously commented upon. The formation of Female Evening Classes, in connection with the College during the past year, offers a new field for congratulation. The female pupils, although at present few in number, are yet steadily increasing, and the classes have in other respects an improving aspect. The number of females attending these classes during the first term was 8, 2nd term was 12, 3rd term was 16, and the number entered during this present term is 20. The following table exhibits at one view the several classes now in active operation at the College, the number of students who entered each class, and the average attendance during each term :—

CLASS,	1ST TERM.		2ND TERM.		3RD TERM.		4TH TERM.	
	No. in Aver.	Class. attndc	No. in Aver.	Class. attndc	No. in Aver.	Class. attndc	No. in Aver.	Cl. attndc
Writing and Book-keeping	55	30	38	25	vacation		68	45
French, 1st section ...	6	5	4	3	5	4	7	7
„ 2nd section ...	16	13	17	12	12	9	15	11
Algebra, 1st section ...	10	5	6	3	vacation		5	4
„ 2nd section ...	4	2	3	2	ditto		5	2
Mechanical Drawing ...	13	9	20	14	16	10	19	14
Practical Arith- metic, 1st section ...	10	7	13	9	vacation		14	8
Practical Arith- metic, 2nd section ...	39	13	35	20	ditto		40	25
Chemistry	13	10	10	7	ditto		11	7
Phonography	not formed		not formed		51	36	45	31
Grammar, 1st section ...	12	9	11	8	16	10	22	13
„ 2nd section ...	39	18	38	25	vacation		39	23
Logic	13	11	16	13	ditto		11	10
Drawing and Painting ...	not formed		12	9	18	11	23	16
Mensuration	ditto		9	5	vacation		3	2
German	ditto		not formed		not formed		13	8
Latin, 1st section ...	8	6	9	6	vacation		6	3
„ 2nd section ...	5	2	3	2	ditto		5	3
Elocution	25	22	18	12	ditto		26	19
Geology	13	9	7	6	ditto		13	10
Rudimentary Classes ...	36	18	24	10	20	9	39	18
Female Classes ...	not formed		8	5	12	6	18	10

The trades of the 327 members are :—Mercantile clerks, 63; warehousemen, 56; printers, 20; decorative artists, 7; shopmen, 11; teachers, 7; various handicraftsmen, 51; labourers, millhands, and sundry miscellaneous occupations, 112; total, 327. In addition to the members hitherto spoken of, the College has about 30 annual subscribers, 31 life members, 15 honorary members, and 26 honorary teachers; the total members of the College of every description, numbering 424 individuals. In addition to the classes contained in the return for the past year, a class for the study of English History and Literature, a class for gymnastics, drill and fencing, and an essay and discussion society have been formed and opened. The boys and girls' day schools maintained by the College, are in a steadily improving condition. The boys' day school has increased from 120 to 135, with an average weekly attendance of 103. The girls' day school has progressed rapidly. During the year ended December 1859, the number of girls on the register was 58, and the average attendance 41. In December last the number of girls on the register was 91, and the average attendance 68. The boys' evening classes are still continued, the number on the books having averaged 35 per month and the average attendance being 28. The income of the year on revenue account, from every source, amounted to £247 13s. 2d., and the expenditure to £218 17s. 5d. The

balance in favour of the College, £28 15s. 9d., has been applied in re-imbursing the Treasurer the sum of £28 14s. 10d., overpaid by him during the preceeding year, so that the College has commenced a new year free from debt.

To Correspondents.

ERRATUM.—In last *Journal*, at page 528, col. 1, line 38, for “October, 1849,” read “March, 1850.”

MEETINGS FOR THE ENSUING WEEK.

TUES....Statistical, 8. Dr. Steele, “Statistical Analysis of Patients treated in Guy's Hospital from 1854-60 inclusive.”
WED....Geological, 8.
THURS....Zoological, 4.
 Philosophical Club, 6.
 Numismatic, 7. Anniversary.
 Linnean, 8.
 Chemical, 8. Dr. Roscoe, “On the application of the induction coil to Steinheil's apparatus for spectrum-analysis.”
 Royal, 8½.
SAT......Royal Botanic, 3¼.

PARLIAMENTARY REPORTS.

SESSIONAL PRINTED PAPERS.

Par.
Num.

Delivered on 29th and 30th May, 1861.

248. Bishops' Lands (Ireland)—Returns.
 273. Worcester Bishopric—Return.
 277. Conveyance of Mails (Galway and America)—Return.
 278. Prisoners—Return.
 280. Scottish Universities—Copy of an Ordinance.
 276. Atlantic Royal Mail Company—Copy of a Letter, &c.
 149. Bills—University Elections (as amended by the Select Committee).
 150. „ Jersey Court.
 152. „ Municipal Corporations Act Amendment.
 Syria—Convention for prolonging Occupation to 5th June, 1861.
 Affairs in Japan—Correspondence.

Delivered on 31st May, 1861.

235. Australian Mail Service—Return.
 142. Bills—Annoyance Jurors (Westminster) (Amended).
 151. „ Local Government Supplemental.
 United States—Correspondence respecting Blockade.
 Poor Law Board—Thirteenth Annual Report.

Delivered on 1st and 3rd June, 1861.

276. Atlantic Royal Mail Company—Letter, &c. (a corrected copy).
 284. East India (Vellore Mutiny Commission)—Return.
 290. Isle of Man—Return.
 293. Committee of Selection—Seventh Report.
 297. University Elections Bill—Report and Minutes of Evidence.
 132. Bills—Harbours (amended).
 153. „ Volunteers' Tolls Exemption (No. 2) (amended).
 164. „ Excise and Stamps (as amended in Committee and on Re-commitment).
 155. „ Lace Factories.
 Captain Macdonald (Arrest and Imprisonment)—Further Correspondence.

Delivered on 4th June, 1861.

282. Foreign Sugar—Account.
 106. Bill—Window Cleaning, &c.
 China—Correspondence respecting the Opening of the Yang-tze-Kiang River to Foreign Trade.

Delivered on 5th June, 1861.

286. Transportation—Report from Committee.
 294. Sowers Commissions—Return.
 296. British Dependencies—Return.
 300. Armed Cruisers and Privateers (America)—Copy of a Letter.

PATENT LAW AMENDMENT ACT.

APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[From *Gazette*, June 7th, 1861.]

Dated 5th March, 1861.

554. T. Petitjean, 4, Brydges-street, Covent-garden—Imp. in the manufacture of glass.

Dated 17th April, 1861.

939. J. R. Hill, Duke-street, Adelphi—Imp. in clutches or connections for machinery.

Dated 29th April, 1861.

1072. F. A. Thonier, Bourbon l'Archambault, France—Imp. in reaping machines.

Dated 2nd May, 1861.

1102. L. Glataud, Roanne, France—Improved means or apparatus for releasing horses from vehicles, and for locking the wheels thereof in prevention of accident.

Dated 3rd May, 1861.

1114. P. A. Godfroy, 3, King's Mead-cottages, New North-road, Islington—An imp. in the manufacture of gutta percha.

Dated 7th May, 1861.

1154. J. H. Johnson, 47, Lincoln's-inn-fields—An imp. or imps. in buttons for garments or other purposes. (A com.)

Dated 8th May, 1861.

1158. T. Blackburn and M. Knowles, Blackburn—Imp. in looms for weaving.

1164. L. Wytenbach and P. Lugand, 12, Rue Caumartin, Paris—Imp. in fire-escapes.

Dated 10th May, 1861.

1188. A. L. E. Maulbon, 15, Passage des Petites Ecuries, Paris—Imp. in machinery or apparatus for manufacturing tiles. (A com.)

1192. P. A. Godefroy, 3, King's Mead-cottages, New North-road, Islington—An imp. in the treatment of india-rubber.

Dated 11th May, 1861.

1196. H. J. Davies, Carlisle—Imp. in apparatus or machinery for printing textile fabrics or materials.

1202. G. F. Jones and J. Jones, York—Imp. in the form and construction of ships or vessels, and of arched ribs for roofs, domes, and bridges.

1204. W. H. Tooth, Rhodewell-road, Middlesex—Imp. in machinery or apparatus for reducing vegetable substances to a finely-divided state, part of which imps. may also be employed for sifting or separating the fine from the coarse particles of other substances.

Dated 13th May, 1861.

1218. J. H. Johnson, 47, Lincoln's-inn-fields—An improved magic lantern, and of views to be used therewith. (A com.)

1219. W. Smith, Little Woolston, Buckinghamshire—Imp. in cultivators, ploughs, and apparatus used therewith when cultivating and tilling land.

Dated 17th May, 1861.

1263. G. Davies, 1, Serle-street, Lincoln's-inn—A peculiar mode of arranging advertisements, so as to secure a more general and constant publication. (A com.)

Dated 20th May, 1861.

1288. O. Papengouth and L. I. Lehmann, Blackfriars-road—Imp. in propelling vessels, and in apparatus for the same.

Dated 23rd May, 1861.

1305. L. Lumb, Brotherhood Mills, near Rochdale, and W. H. Butterworth, Reed Hill, Rochdale, Lancashire—Imp. in under-covers of carding engines.

1306. C. Nuttall, 34, South-lane, Rochdale, Lancashire—Imp. in machinery for grinding the cards of carding engines, and in machinery for making the same.

1307. J. Hynam, Wilson-street, Middlesex—Imp. in apparatus for arranging splints for matches, and for placing them in the frames ready for "dipping."

1309. J. H. Dart, 5, Church-court, Clement's-lane—Imp. in the manufacture of paper.

1311. R. A. Brooman, 166, Fleet-street—Imp. in portable cooking apparatuses. (A com.)

1312. E. Partridge, Smethwick, Staffordshire—An improved method of lubricating carriage axles.

1313. H. M. F. J. V. de la Tour-du-breuil and M. A. de la Tour-du-breuil, 29, Boulevard St. Martin, Paris—A copying press, so called "telegraph-press."

Dated 24th May, 1861.

1314. C. Batty, 196, Marylebone-road, Middlesex—Imp. in the mode of and apparatus for warming and ventilating rooms and buildings.

1315. B. Collingham, Keighley, Yorkshire, and M. Mason, Manchester—Imp. in flyers employed in machinery for preparing and spinning fibrous substances.

1317. R. Joslin, 36, King William-street—Imp. in gentlemen's scarfs.

1318. G. Herbert, Summer-hill, Dartford, Kent—Imp. in apparatus for striking bells.

1319. J. Paterson, Wood-street—An imp. in clasps or buckles.

1320. R. Procece, Clapham-road, Surrey—An imp. in floors.

Dated 26th May, 1861.

1321. H. Waller, Lickhill, near Calne, Wiltshire—An improved horse rake.

1323. W. Roberts, Millwall, Poplar—Imp. in vices and screw benches.

Dated 27th May, 1861.

1324. W. Kay, Bolton-le-Moors, Lancashire, and I. Kay, Leverbridge, near Bolton-le-Moors—Imp. in machines for spinning and doubling.

1325. E. Green and J. Cadbury, Birmingham—Certain imp. in buttons for general use.

1326. W. Smith, Green Nook Mill, Lancashire, J. Lord, and H. Barlow—Imp. in looms for weaving.

1327. T. Moore, Southwark-bridge-road, Surrey—Imp. in apparatus for raising water and other fluids, which same apparatus may also be employed as a prime mover.

1329. C. S. Duncan, Kildare-terrace, Baywater—Imp. in the construction of electric telegraph cables or ropes.

1330. L. A. S. Churchill, 16, Rutland-gate, and E. W. H. Schenley, 14, Princes-gate, Middlesex—Imp. in buffing and coupling apparatus for railway carriages. (A com.)

1331. J. Lee and B. D. Taplin, Lincoln—Imp. in the manufacture of portable or traction steam engines, and in apparatus for cutting joints, heads of connecting rods, and other articles.

1332. W. B. Holbech, Thurlaston Lodge, Leicestershire—Imp. in apparatus for sowing seeds.

1333. W. N. Nicholson, Newark-on-Trent—Imp. in machines for making and collecting hay, and for collecting similar substances; parts of which imps. are applicable to cutting thistles and other weeds.

Dated 27th May, 1861.

1335. E. R. Burnham, Liverpool—Imp. in the manufacture of boots, shoes, and other coverings for the feet made of india-rubber, gutta-percha, and like substances.

1336. P. A. Millward, Wednesbury, Staffordshire—Imp. in the manufacture of coke.

Dated 29th May, 1861.

1337. G. W. Rendel, Elswick Ordnance Works, Northumberland—Imp. in the manufacture of wrought iron cylinders for the construction of ordnance.

1338. R. M. Letchford, Old Montague-street, Middlesex—An imp. in the manufacture of matches.

1339. G. Asher, Birmingham—An imp. or imps. in the manufacture of metallic fenders.

1340. H. Crichley, Birmingham—Imp. in the manufacture and ornamentation of metallic chimney pieces or mantel pieces, and in the ornamentation of metallic stoves and fire places.

1341. E. H. C. Monckton, Parthenon Club, Regent-street—Obtaining and applying magnetic motive power.

1342. C. Ching, Castle-street, Long Acre—Imp. in gas chandeliers.

1344. T. Hale, 21, Barnsbury-row, Park-road, Islington, and A. Wall, 12, Canton-street, East India-road—Imp. in the construction and internal arrangement of furnaces, and in the preparation, manufacture, and treatment of clays, and of articles, surfaces, structures, and erections, subject to the action of fire or atmospheric influence.

1345. W. E. Newton, 66, Chancery-lane—Imp. in refining and purifying iron, and converting the same into steel. (A com.)

PATENTS SEALED.

[From Gazette, June 7th, 1861.]

3022. T. Peake.	3100. J. G. Taylor.
3036. R. A. Ford & W. A. Paige.	3136. D. A. Morris.
3047. A. F. Jaloureau.	3182. W. E. Newton.
3050. C. P. Moody.	3183. A. V. Newton.
3051. G. S. Harwood.	118. A. V. Newton.
3060. G. E. Chantrell.	248. G. T. Bousfield.
3068. E. Jones.	250. G. T. Bousfield.
3084. G. Davies.	483. J. Warren.
3086. G. Davies.	718. T. S. Truss.
3088. A. Kinder.	826. J. T. Grice.

[From Gazette, June 11th, 1861.]

3053. G. Richardson and E. D. Chattaway.	3131. F. B. Baker.
3057. J. Cason.	3157. J. A. Fanshawe and J. A. Jaques.
3061. C. Neville.	3163. S. Desborough and S. Middleton.
3063. S. Pitts.	3. M. Henry.
3080. H. Barber.	17. A. V. Newton.
3085. G. Davies.	25. A. Fairbairn.
3087. J. G. Williams.	261. G. T. Bousfield.
3089. A. Prince.	513. W. J. Hay.
3105. C. Stevens.	539. G. G. Sanderson.
3113. J. H. Johnson.	585. B. Britten.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[From Gazette, June 7th, 1861.]

June 3rd.	June 5th.
1469. P. P. C. Barrat and J. B. Barrat.	1277. J. Ferrabee.
	1305. P. Domont.

[From Gazette, June 11th, 1861.]

June 6th.	June 8th.
1278. J. J. Rowley.	1304. J. Easterbrook.
1318. T. Chatwin and C. Taylor.	1328. G. Bartholomew.
	1368. T. Steven.
June 7th.	June 8th.
1292. J. Bunnett.	1414. S. Barlow.

PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

[From Gazette, June 11th, 1861.]

June 8th.
1279. J. Bernard.